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it, but now it would be a severe task for a man standing in his eighty-third year.

Receive, dear sir, with my thanks my heartiest wish that you may be permitted to enrich astronomy many fold through similar works.

OTTO STRUVE.

NEW DOUBLE STARS.*

For somewhat more than two years I have devoted a portion of my time to the examination of large numbers of stars in various parts of the sky for the purpose of detecting hitherto unknown double stars. This search has resulted in the discovery of five hundred new pairs, having distances under five seconds of arc. These new pairs are being announced, a hundred at a time, as rapidly as sets of measures for them can be obtained. Observations of three hundred have already been published, and those of a fourth hundred are now in the hands of the printers.

The following table gives the classification of the stars with respect to the distances between their components:—

	1st Cat.	2d Cat.	3d Cat.	4th Cat.	Total.
0".25 or less	3	9	5	13	30
0 .26 to 0".50	12	16	12	30	70
0 .51 to 1 .00	24	22	20	24	90
1 .01 to 2 .00	29	26	25	18	98
2 .01 or more	32	27	38	15	112

According to this table 72 per cent. of these four hundred pairs have distances not exceeding 2"; 48 per cent. not exceeding 1"; and 25 per cent. not exceeding 0".5.

I have endeavored to conduct my search for new pairs in a systematic manner, and in the end it is hoped that the work will afford considerable data concerning the distribution of the close double stars in various parts of the sky and of their numbers in respect to magnitude and in proportion to the total number of stars examined.

In examining large numbers of stars with high powers under good atmospheric conditions in various parts of the sky, one is impressed with the fact that the close double stars, say those having distances under 5", are not distributed over the celestial sphere strictly proportionally to the number of stars to a given magnitude, say 9.1. In some places one may examine all the stars to this magnitude over a large area without finding any new

* From Lick Observatory Bulletin No. —.

pair and but few known ones, while in other regions the double stars are comparatively numerous. This probably has a physical significance. Apparently the conditions which determine the existence or non-existence of double stars in given directions prevail throughout spaces of enormous extent. W. J. HUSSEY.

PUBLICATIONS OF THE LICK OBSERVATORY, VOL. V.

Volume V of the *Publications of the Lick Observatory* has recently been distributed. The volume contains the micrometrical observations of the double stars discovered at Pulkowa, better known, perhaps, as the O Σ stars, made by Astronomer W. J. HUSSEY with the 36-inch and 12-inch refractors of this Observatory since the beginning of 1898, together with the mean results of the previous observations of these stars.

In all, 547 stars were observed, requiring 2,109 measures, not counting 65 examinations of stars found single. In the course of these observations, Professor HUSSEY found new companions to the stars O Σ 190, O Σ 247, O Σ 283, O Σ 351, and O Σ 476. By the discovery of the new companions to O Σ 351 and O Σ 476, these stars become the closest visual triples at present known.

The introduction states the motive of the work, describes briefly the instruments used and the methods of observing, and gives a general account of OTTO STRUVE'S discoveries and measures, and his efforts to eliminate the systematic errors known to exist in his work.

In connection with the collected measures of each star, Professor HUSSEY gives such discussion of the character of the star's motion as is warranted by the existing material, and complete references to the original sources of the observations.

The stars are arranged in the order of their numbers in the body of the work, and a catalogue is appended giving them in the order of Right Ascension.

The volume gives practically a complete history to date of the Otto Struve stars, and in a form that will, it is thought, prove exceedingly convenient and valuable to all who are interested in the subject of double stars.

The volumes addressed to our foreign correspondents have been distributed through the kind offices of the Smithsonian Institution, and will reach their destinations in due time.

W. W. CAMPBELL.